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ABSTRACT

In an examination of the meaning and measurement of quality in the undergraduate experience, quality is compared with the conceptually similar but distinct concepts of adequacy and excellence. Most of the conceptual frameworks available for assessing quality are essentially unidimensional assessment strategies that rely almost exclusively on quantitative indicators such as student ability or library resources. The most popular multidimensional approach to assessing quality is the input-environment-output model. A redefinition of Stufflebeam's et al. planning and evaluation model includes: context, input, involvement, and outcome. Using these categories, the opinion and empirical research related to quality were reviewed to assess indices of quality. Quantitative quality assessment usually focuses on institutional factors about which objective, standardized measures are available or can be collected, and produce data that (1) can be used for both intra- and interinstitutional comparisons; (2) are amenable to computer-assisted analytic procedures; and (3) are compatible with the psychometric paradigm. For qualitative quality assessments, manifestations such as students' reports of satisfaction with various aspects of the institution or observations of students' involvement in the classroom or other activities are primary data sources. Holistic quality assessments are concerned with: the purpose of the target programs, information about involvement and outcomes of college attendance, an action-orientation, multiple forms of data-gathering, a public and educative function, and a value orientation. (SW)

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The Meaning and Measurement of Ouality in the Undergraduate Experience

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THE MEANING AND MEASUREMENT OF QUALITY

IN THE UNDERGRADUATE EXPERIENCE

Most institutions of higher education share a history of steady and, at times, almost exponential expansion. At present, a large proportion of colleges and universities are preparing to educate about the same or slightly smaller numbers of students with more diverse learning requirements but have fewer "real" (inflation adjusted) dollars available. Concurrently, societal expectations for education remian unrealistically high even though the "new Federalism" and sluggish local economies have resulted in reduced appropriation levels. For these as well as other context specific reasons colleges and universities have begun to look inward to determine how to maintain "quality". Indeed, in 1980 the two largest higher education associations used quality as the cornerstone of their respective convention themes.

A number of researchers have used various methods to produce "reputational ratings" of institutional "quality" (e.g., Blau & Margulies, 1975; Cartter, 1966; Roose & Anderson, 1970). For the most part, these ratings have focused on department or major fields as the unit of analysis. With few exceptions (e.g., Heath, 1968), quality of the undergraduate experience per se has not been treated in any detail in the literature.

Few disagree that quality is an appropriate goal to pursue. Often avoided or overlooked in the search for quality is what the concept essentially entails. That is, the meaning of quality is rarely discussed. Without considering what quality implies, efforts to adequately asses quality lack focus. In this paper, the meaning and measurement

of quality in the undergraduate experience are examined. First, some consideration is given to what quality connotes. Quality is compared with the conceptually similar but distinct concepts of adequacy and excellence. Then, frameworks used to estimate quality in the undergraduate experience are reviewed and an alternative approach to aggregating indices of quality is described and used in a review of the literature on quality in higher education. The advantages and disadvantages of various approaches to measuring quality are discussed. Finally, guiding principles for holistic quality assessments are presented.

The Meaning of Quality

The concept of quality has as many as eight different nuances (Merriam, 1976, p. 944). Definitions of quality range from the vividness of color to the timbre of a vowel sound. However, Straumanis (1981) has argued that the concept of quality is best represented by a judgment continuum anchored by somewhat different applications of the concept: (1) description; and (2) evaluation (see also Harshman, 1979).

On the descriptive end, quality connotes a characteristic of someone or something without an appraisal of the value of the characteristic or the person or object exhibiting the characteristic (McCall, 1976). For example, if a high school teacher attests that an applicant for admission to Siwash University "has personal qualities consistent with Siwash standards," the recommender probably means that the prospective student possesses certain traits and academic and social experiences that, taken together, suggest the student can be successful at Siwash.

In the evaluative meaning, quality is used to describe the value of an object, person, or experience (Cartter, 1966). In the above example, if the recommender wrote, "the applicant has produced quality work throughout her four years at Eisenhower High School," the comment would suggest positive appraisal of the applicant's performance as contrasted with a potentially negative evaluation of individual achievement.

The quality continuum also reflects the degree to which clarity is represented in an object or experience (Campbell, Converse & Rogers, 1976). Indeed, one of the reasons greater specificity has not been attempted in the literature is that quality is a rather ambiguous entity, particularly when applied to higher education. The more ambiguous an entity, the less agreement on what constitutes an entity. Yet, it is easier to agree on a description of an experience than an evaluative summary of the experience. The latter calls for declarations of values and personal taste which together require a clearer definition of the entity to be evaluated. Quality in the undergraduate experience is ambiguous and, therefore, somewhat easier to describe. But the value of college is much more difficult to estimate because an evaluative assessment requires clarification of the variables and the relationships between variables that comprise students' experiences.

Toward a Definition of Quality

Quality is comprised of an elusive set of properties (Persig, 1974). To produce quality, function is emphasized over form; i.e., the outcome or products of any given set of experiences are usually more important than the means used to produce the outcome. Quality

and cost may be positively correlated but the relationship is probably far from perfect (Jenny, 1979; Millett, 1979). For example, if an inexpensive item is satisfactory and satisfying such as a 29¢ Bic pen or a cut rate brand of aspirin, so much the better for the consumer. Similarly, a moderately priced institution that meets the developmental needs and expectations of the student is probably preferrable to a higher priced institution (Upton, 1963).

Quality is not a normative property. That is, quality is not well served by arbitrarily forming categories or classes of high, medium, and low quality, and assigning proportionate numbers of academic programs or institutions to the various classes. Rather, quality is determined by students and others applying standards to an experience during and after thoughtful consideration of the meaning of the myriad of interactions that comprised the student's experience.

The effects of quality are expected to endure over a long term and positive (valued) if not similar outcomes are expected for most students most of the time (see Olscamp, 1978). Quality infers a high degree of fidelity between the purposes, philosophies, and goals of the institution and the behavior of persons frequenting the institution's environment (Chickering, 1969; Keeton, 1974). But the concept of quality also includes an esthetic property or some degree of sensuous pleasure. Quality may not necessarily reflect perfection, for educated persons without quirks and surprises tend to be rather uninteresting (Bowen, 1979). Indeed, such uniformity would be inconsistent with the aims of liberal education that appear in most college catalogues!

Quality in the undergraduate student experience is better thought

of as a simple elegance, a perceived sense of well being and accomplishment (Withey, 1975) including a variety of sensations shared by partners in the enterprise. Students, faculty, administrators, staff, and others feel comfortable and satisfied as a result of being involved in purposeful experiences. However, not all constituencies, particularly but not exclusively students, may be comfortable or satisfied at all times during the undergraduate program. Curricular and cocurricular challenges that upset students' equilibrium and encourage students to greater degrees of differentiation and personal integration are required to fulfill the development of the "whole person" goal to which most institutions subscribe (see Knefelkamp, 1980; Perry, 1970; Sanford, 1962).

Adequacy, Excellence and Quality

When applied to educational settings, the concepts of quality, adequacy, and excellence have similar but not interchangeable connotations. Therefore, unless distinctions are made between these terms, considerable confusion can result when interpreting the meaning of quality.

All three concepts require comparison with some predetermined criteria to reflect attainment of a particular purpose or requirement. The shades of distinction between these terms can be illuminated by applying the criteria of merit and worth. Lincoln and Guba (1979) have argued that merit represents an intrinsic, context-free value, "independent of any requirements of applicability or use" (p. 1). Scientific discoveries are often meritorious because scientists appreciate an important addition to knowledge for its own sake. If a discovery is without theoretical significance (lacks merit) but has utility in a practical

context, the discovery would be worthwhile. Worth, therefore, is an extrinsic, context specific value.

Adequacy suggests a level of sufficiency for certain persons in a specific context or setting (McCarthy, 1981; Merriam, 1977, p. 14; Wise, 1976) and embodies the elements of worth but not necessarily merit. Excellence intimates an absolute superior standard of attainment, standards that are not time or context bound and are good in their own right; therefore, the merit criteria are met but not necessarily the worth criteria. The concept of quality embodies characteristics of both merit and worth; that is, a high (but not necessarily superior) level of attainment is required that also has utility or worth (makes sense and feels right) for those involved in the experience.

For example, consider two programs designed to enhance the personal development of students in a residence hall. One activity is a series of workshops with the purpose of increasing interpersonal communication skills. The purpose of this program has both merit and worth. Liberally educated individuals are expected to be able to interact with a wide variety of persons (merit). Also students in the hall have exhibited a need for and expressed an interest in further developing their capacity to effectively communicate with their male and female counterparts (worth). The purpose of this program is defensible.

The second activity's purpose is to develop autonomy among residents in another hall. This purpose has merit in that the capacity for autonomous, independent thinking and decision making is valued in an educated society. However, the activity may not have worth if the residence unit is experiencing difficulty coordinating the policy making functions of its

various committees. An activity that encourages, at this particular point in time, active experimentation with behaviors characteristic of assertive or independent thinking persons may be ill-timed because such experimentation may actually impede attainment of the larger community's goals. Perhaps another set of activities addressing interdependence among residents would be more appropriate and therefore of higher quality at that particular time with that particular group of students.

Quality is a many-faceted property. While not "mystical" (Astin, 1980), quality is difficult to assess. Nevertheless, judgments about quality are rendered everyday. Intra- and interinstitutional comparisons for the purposes of resource allocation are common (Astin, 1980; Jenny, 1979; Young, 1976). Some of the problems associated with measuring quality may be exacerbated by flawed frameworks within which the elements contributing to quality have been considered.

Frameworks for Assessing Quality

Most of the conceptual frameworks available are essentially unidimensional assessment strategies which rely almost exclusively on quantitative indicators such as student ability or library resources. For example, in a simplistic form of an input-output or "pipeline" approach, the guiding assumption is that college is essentially a conduit through which raw materials pass relatively untouched. If high ability students matriculate, the college can expect to have many highly able, successful alumni. In other words, because the "impact" of the college is negligible, institutional quality is unimportant except insofar as attracting students is concerned.

Most observers agree that multiple dimensions of an experience must be considered to estimate the degree to which quality is present (Epstein & McParland, 1976; Palola, 1976; Solmon, 1981). Perhaps the most popular multidimensional approach to assessing quality is the input-environment-output model (Astin, 1977, 1980). Inputs represent what students bring with them to college (ability, interests, etc.); outcomes are measures of cognitive and affective changes between students and others (faculty, peers, etc.) as well as actual institutional resources such as library holdings and so forth.

The role of the college environment can be interpreted from two perspectives (Astin, 1977). As a "factory," the institution takes the raw materials (students' input characteristics), rearranges, reconstitutes, or refines these materials, and produces a particular kind of product (developed student). Astin (1977) suggested that a medical model perspective may have greater utility in understanding the influence of the environment on students' development. Of course, students are not considered "sick;" however, the extent to and ways in which students benefit from college is not unlike an ill patient with access to a medical facility. If the student plays an active role in the process, takes advantage of the opportunities available, and understands how the experience will assist in attaining valued goals, the chances for a satisfactory learning experience ("health") increase. In this interpretation, the institution and the student share responsibility for students' outcomes.

The availability of certain institutional resources such as faculty, intramurals, library, and laboratory facilities, and student support

services and students' use of these resources make conceptually distinct contributions to quality. The former are indicators and are comprised of surrogate or proxy student or institutional characteristics. The latter are after-the-fact manifestations of student effort. To be useful in estimating quality, indicators should be empirically related to manifestations of quality (Straumanis, 1981).

A Comprehensive Quality Assurance Framework

To more clearly understand the relationship of qulaity to various elements of the undergraduate experience, the structured components of a popular planning and evaluation model (Stufflebeam et al, 1971) were redefined. The following conceptual framework resulted:

(a) Context--characteristics of an institution's environment that are relatively stable over time such as expenditures per student, size of student body, and proportion of faculty with doctorates.

(b) Input--characteristics of entering students such as intellectual ability, interests, and aspirations.

(c) Involvement--interactions (manifestations) that characterize the environment in which students live and learn such as the amount, type, and opportunity for informal interaction between students and faculty, students' satisfaction with the institution, and student effort (Pace, 1980).

(d) Outcome--intended products or unintended effects (manifestations) associated with college attendance such as retention rates, achievement levels, student development measures, and alumni achievements.

Using these categories as advance organizers, the opinion and empirical research related to quality were reviewed and synthesized

to answer the following questions:

(a) What kind of indices are available to estimate quality?

(b) What indices are used most often to estimate quality and how are they derived?

(c) How can estimates of quality be improved?

Review of the Literature on What Constitutes Quality in the Undergraduate Experience

Over 200 literature entries were reviewed including:

(a) Articles appearing in professional educational journals such as Change, Journal of Higher Education, Review of Educational Research, and monographs such as those produced in the ERIC/AAHE Research Report series;

(b) Pertinent documents identified through a computerized search conducted by the ERIC Clearinghouse on Higher Education;

(c) Books and other published works reporting social and behavioral science efforts to estimate quality of life;

(d) Previously unpublished material and reports such as papers presented at recent meetings such as the American Association of Higher Education, the American Educational Research Association, and the Association for Institution Research.

After a preliminary review, the materials were assigned to one or more of the following categories for a more detailed analysis: (a) context indicators, (b) input indicators, (c) involvement manifestations, (d) outcome manifestations, and (e) quality assessment methodologies. Then the literature related to each of the categories was independently analyzed

and summarized. The criteria used to determine salient indices of quality were empirical support, cogency of argument, and repetition of mention (see Hutson, 1979 for a more detailed explanation of this literature review procedure). From this analysis, conclusions were drawn concerning: (a) whether various indices of quality appear useful; (b) the degree to which institutional agents such as administrators and faculty contribute to the quality of the undergraduate student experience.

In the following sections, salient indices of quality reported in the literature are summarized. A more detailed analysis of the relative utility of these indices in estimating the quality of the undergraduate experience can be found in Kuh (in press).

Context

Four context indices may be worthwhile indicators of quality at many institutions. Many positive indicators and manifestations of quality have been associated with institutional size (Bowen, 1977; Rock, Centra & Linn, 1979). For example, smaller institutions tend to have clearer purposes; as a result, a greater sense of community is often fostered among students attending smaller institutions (Heath, 1968). In addition, opportunities for assuming leadership positions in cocurricular activities such as student government and informal contact with faculty tend to increase (Astin, 1977; Chickering, 1969; Pace, 1981). Of course, the size of an institution does not cause these things to happen; rather size encourages their occurence (Table 1).

Clarity of institutional purpose has been referred to repeatedly as an earmark of a high quality institution (Astin, 1980; Meeth, 1974; Keeton,

1971). Large universities must have multiple purposes and missions to satisfy their diverse and sometimes competing stakeholding audiences (e.g., trustees, taxpayers, students, alumni). Therefore, such institutions rarely are able to project a salient purpose to most persons most of the time.

Student living environments also appear functionally linked to quality (Astin, 1977; Chickering, 1974; DeCoster & Mable, 1930; Feldman & Newcomb, 1969). Students spend a disproportionate amount of time during the undergraduate years engaged in nonclassroom related activities (Wilson, 1966). Therefore, the degrees to which students are challenged by and satisfied with their living environments merit continued emphasis in the search for quality.

Formal systematic properties such as administrative structures and decision making strategies have not been empirically related to quality (Bowen, 1979). However, the informal organization comprised of norms that encourage or hinder faculty involvement with students and the extent to which students feel and act as though they are members of the academic community seem to be particularly promising areas of inquiry for those interested in enhancing the quality of the undergraduate experience (Benezet, 1981).

Insert Table 1 about here

Input

Although input indicators such as high school class rank and SAT or

ACT scores have often been used (Bowen, 1981; Millett, 1979), few empirical relationships between manifestations of quality such as value-added achievement or retention rates and input indicators have been found (Astin, 1977). The degree to which nonintellective characteristics of students such as interests and aspirations is consistent with an institution's environmental press has been positively correlated with student satisfaction and persistence (Chickering, 1974; Moos, 1979; Pace, 1969; Stern, 1970). But as quality indicators, these variables have not been powerful predictors of quality manifestations (Table 2).

Student ability is perhaps the most often used indicator of quality (Astin & Solmon, 1979). Yet, various inquiries with slightly different foci have been unable to document whether the ability of students is positively related to the quality of the experience. Most studies linking ability with subsequent manifestations of quality have been quantitative. Perhaps case study portrayals of students with varying levels of ability in institutions with different purposes could help fill the apparent knowledge void about the relationship between student ability and quality in the undergraduate experience.

Insert Table 2 about here

Involvement

The degree to which students are involved during the undergraduate years is one of the most important and, perhaps, accurate manifestations of quality (Astin, 1977, 1979; Astin & Scherrei, 1980; Pace, 1980; Scott, 1980). Involvement is related to a variety of other indicators and mani-

festations often empirically or logically associated with quality: institutional size, general satisfaction with the institution (including satisfaction with the living environment and academic pursuits --see Kegan, 1978), persistence to completion of degree objective (Astin, 1977), postcollege community service, and income. The "quality" of effort students expend is currently receiving attention (Pace, 1979, 1980, 1981) and may prove helpful in distinguishing between students benefiting in profound ways from college and their counterparts who become dissatisfied and/or leave the institution (Table 3).

The degree to which faculty expend effort in instruction or are involved with students out of the classroom has been positively related to many manifestations of quality (Bean, 1981; Bragg, 1976; McKeachie, 1978; Menges, 1981; Pascarella, 1980; Sanford, 1967; Snyder, 1971; Student Task Force on Education at Stanford,1973, Trow, 1975). Identification of the factors related to faculty involvement (e.g., morale, salience of institutional purpose) seems a promising line of inquiry.

Insert Table 3 about here

Outcomes

Persistence enables students to take advantage of a variety of other opportunities related to quality (Astin, 1979); e.g., interaction with faculty and peers and participation or perhaps leadership in institutional governing processes (Table 4). Therefore, persistence is, like size, a mediating index. Yet persistence may have a pernicious influence as well (Chickering, 1971). Some students may become placated or too satisfied

with the college experience. A number of these students probably persist to graduation but the meanings they make of their expriences have been rarely challenged, especially in their living environments. This is more likely to be true for the increasing proportions of part-time commuting students (Chickering, 1974; Astin, 1977).

Alumni studies are thought to be perhaps the best source of information about college quality (Boulding, 1975; Freedman, 1962; Pace, 1979). Bowen (1979) suggested that many important outcomes of college cannot be documented at commencement because the impacts or changes will not be manifested until some years later.

> The residue of a college education--after the initial forgetting of detail--is a virtual mystery. Moreover, we should be interested in the values and attitudes of alumni, their interests, their citizenship, their family life, and their careers as these may have been affected by their college experiences (p. 25).

The search for value added outcomes of college have met with little success (Astin & Panos, 1979). Aggregation and measurement of change problems have often been cited as contributing factors to insignificant findings (Astin, 1977). Interestingly, those few researchers (e.g., Cottle, 1975; Heath, 1968; Perry, 1970; White, 1966) who have conducted intensive studies of small samples of students and alumni have reported provocative accouts of what happens to students during and after college. Like quantitative assessments of the same phenomena, these approaches also have limitations; but the insights they may provide concerning value

added outcomes of college are descriptively rich (see Trow, 1975).

The empirical evidence has suggested that graduating from a higher "quality" college will result in greater earnings during the post-college years (Solmon, 1972; Wachtell, 1975). It is unclear whether income is more a function of the contributions of the undergraduate experience or some other variable such as socioeconomic status (see Karabel & Astin, 1972) which may be unrelated to the quality of the education experience.

Insert Table 4 about here

Quantitative and Qualitative Contributions to Quality Assessment

Quality is a multidimensional concept. After reviewing the literature on quality in the undergraduate experience, it is clearer why: (1) few assessment efforts which attempt to account for the multiple properties of quality have been mounted; and (2) most "quality assessments" rely on indicators rather than manifestations of quality.

In general, methodological approaches to quality assessment can be divided into two categories: quantitative and qualitative. Each represents a different way of attempting to describe the same series of events. In practice, most intrainstitutional efforts to estimate quality incorporate elements from both paradigms. These two approaches are separated for discussion purposes for two reasons: (1) adherence to one approach to the exclusion of the other substantially influences (a) what is assessed and (b) the assessment startegies employed; (2) quantitative methods have dominated quality assessments for a considerable period of time and therefore it seems appropriate to illuminate the advantages, limitations, and relative

utility of different approaches (Stark & Lowther, 1980). Guba's (1978) points of comparison between conventional and naturalistic inquiry serve as a framework within which the contributions of different approaches to estimating quality can be considered.

Quantitative

Quality assessments are often based in the logical positivism characteristic of the agricultural-botony and psychometric traditions (Sherman, 1981) and rely almost exclusively on operationally defined and objective measures (Astin & Solmon, 1979). Therefore, quantitative assessments usually focus on institutional factors about which objective, standardized measures are available or can be collected. A predetermined, reductionistic framework is used to identify those variables which appear to be related to the factor of interest.

In a sense, the quality assessment is almost unrelated to human interactions and tends to overlook institutional conditions that cannot be "technically" controlled (i.e. through conventional inquiry methods such as inferential statistics). The only value perspective allowed to influence the assessment is that of the investigator's (see Table 5).

Quantitative approaches are attractive because they produce data which: (1) can be used for both intra- and interinstitutional comparisons; (2) are amenable to computer assisted analytic procedures; and (3) are compatible with the psychometric paradigm which has influenced the social sciences for decades. However, quantitative measures are less likely to account for unintended outcomes and acknowledge the range and depth of human experiences. While multivariate procedures are available, most

quantitative assessments have emphasized unidimensional perspectives on quality. Quantitative assessments of quality often correlate two or more input, context, or outcome variables such as aptitude or achievement exam scores such as Scholastic Aptitude Test or Graduate Record Examination; high school class rank; expenditures per student; proportion of faculty with doctorates, faculty salaries, library collections, and number of fellowships awarded to seniors.

Insert Table 5 about here

Qualitative

Sometimes referred to as "naturalistic" or ethnographic, qualitative assessments value an expansionist, phenomenological perspective compatible with ethnography. The guiding assumption is there are different ways of knowing and making meaning. Therefore, to adequately estimate the quality of the experience, those invloved in the process (students, faculty, staff) must be given "an opportunity to describe...and comment on the meaning of those experiences for them" (Wolf, 1979, p. 1). Rather than indicators, manifestations such as students' reports of satisfaction with various aspects of the institution or observations of students' involvement in both in- and out-or-class activities are primary data sources. Qualitative assessments embrace a variety of relatively "subjective" data collection strategies such as observations, interviews, case studies, and review of existing documents (Sherman, 1981). The data collected are "confirmable" (Guba, 1978), but reflect the pluralistic values embedded in the institutional context. Graphic portrayals (what Guba refers to as "thick") result

which communicate a sense of "what" has been experienced "how".

Qualitative assessments are sensitive to unintended effects and outcomes. However, they tend to be labor intensive, appear less objective, and are generally cumbersome when used for interinstitutional quality assessments. The advantages and disadvantages of quantitative and qualitative approaches to quality assessment are summarized in Fugure 1.

Toward a "Holistic" Appraisal of Quality

Can quality be adequately estimated using either a quantitative or qualitative assessment technique? Because quality is a multidimensional concept, data gathering strategies characteristic of both approaches are required. Exclusive use of one or the other will likely overlook elements of the undergraduate experience that could markedly influence conclusions about quality. More important, to determine what can be done to improve the present level of quality will require multiple perspectives on the college experience (Astin, 1980). For example, while quantitative efforts to rank institutions by the "quality" (ability) of their students make interesting reading (see Astin & Solmon, 1979), they offer little assistance to faculty and staff charged with identifying programs or institutional policies that could be modified to enhance quality.

A holistic, eclectic perspective of quality assessment recognizes the validity and importance of as well as the limitations of contrasting inquiry methods and the different kinds and sources of information emphasized in the quantitative and qualitative approaches (Stark & Lowther, 1980). In holistic quality assessments the data gathering strategies are eclectic and emergent in that the methods employed are dictated by students' purposes

and characteristics, the institution's mission, and the purposes for the quality assessment. Usually more than one form of data gathering are required to illuminate the various aspects of the students' experience (see Parlett and Hamilton, 1976 for a detailed discussion of holistic "illuminative" strategies).

Guiding Principles for Holistic Quality Assessments

When considered together, the six principles introduced below serve as a general framework for holistic quality assessment. Of course, certain institutional factors or circumstances may militate against the use of one or more. In general, however, these guideposts will lend direction to quality assessment activities.

1. Quality assessment is guided by the purpose(s) of the target program or unit and of the students participating in target-sponsored activities.

One of the earmarks of quality often mentioned in the literature is purpose. Therefore, the degree to which the activities of the program or unit under study are compatable with the stated purposes of both the target program and the students may be an indicator of quality. The guiding question is, "What are we trying to do here together?"

Focusing on institutional purposes will probably increase awareness to the "problematic preferences" (competing and sometimes conflicting institutional goals--see Cohen & March, 1972) common to larger institutions. Therefore, the scope of the assessment should be consistent with levels of the organization with the clearest purposes. In other words, focusing quality assessment efforts at the academic program level within a college or on students' living units are more likely to prove helpful than attempting

to estimate the "quality" of the entire institution.

2. Quality assessment seeks manifestations or information about involvement in and outcomes of the college experience.

Using indicators to estimate quality is tempting because indicator data are usually readily available and are relatively easy to manipulate. Quality in the undergraduate experience is not preordinate, however. Rather, quality results from the interaction between students and institutional agents or others (e.g., peers). Therefore, questions of interest to quality assessers are "What do students do here (involvement)?" and "What happens to students as a result of their involvement (outcomes)?" To adequately respond to the latter question, assessment activities must extend beyond the campus borders and into the post-college years.

3. Quality assessment is action oriented.

An important objective of "quality assessment is to inform and guide the implementation of interventions designed to enhance the quality of students' experiences. That is, "What actions do our experiences collecting the information and the data themselves suggest concerning how to enhance quality?" Gathering information for purposes of interinstitutional comparison may have merit. However, more persons in an institution are likely to benefit in more ways if the assessers remain sensitive to changes in policies and practices which could increase quality. In this sense, quality assessment is both descriptive and evaluative.

4. Quality assessment requires multiple forms of data gathering.

"What methods and strategies will tell us what we need to know about the quality of students' experiences?" Without different ways of collecting information about students' and faculty behavior and satisfaction with their

interactions, the multiple realities that exist will not be adequately recorded. Triangulation, cross validation, and a combination of qualitative and quantitative data are required if a reasonably accurate estimate of the quality of the undergraduate experience is to result.

5. Quality assessment is a public, conscious, and educative activity.

To become familiar with the purposes and expectations of students as well as institutional agents, quality assessment activities will generate more useful information when the requirements and perspectives of various stakeholder groups are considered. To operationalize this principle, collaboration between "direct" (student, faculty, staff) and "indirect" (alumni, trustees, legislature, others) contributors to quality is required to adequately describe the quality of the undergraduate experience. "How can various constituent groups be encouraged to participate and benefit from quality assurance activities?"

Participation will enable students and institutional agents to learn more about their respective roles and to reflect on the meaning of their experiences. Access to the process will also maintain enthusiasm for and committment to acting on information generated from the assessment. Assessments will have greater internal credibility if during and after the process, participants know more about the program or unit, themselves, and what connotes quality than they did at the outset. Stakeholders should be periodically informed of the assessment strategy, findings, and potential consequences of possible quality enhancing interventions as they are identified. Particular benefits may accrue to students who experience the complexities of translating findings into action-based alternatives.

6. Quality assessment is value laden.

Pluralistic value orientations of students, faculty across units, staff, and indirect contributors make it difficult if not impossible to achieve consensus concerning what quality is and how quality can be enhanced. Both the meaning and measurement of quality are tied to local values; therefore, objective or "scientific" approaches to quality assurance may be flawed from the start. "What is important to the people in this place?" The smaller the unit and numbers of persons involved, the easier it is to respond and share understandings of value laden issues. Collaboration and negotiation may not satisfactorily resolve disagreements. But to assume quality is not tied to values is to ignore the differences between the quality of students' experiences at one institution and students' experiences at another.

Conclusion

Institutional agents can assess or adequately estimate the degree to which quality is present. However, quality assessment is a rather complex process which requires "muddling through" and a high degree of collaboration. Estimates of quality used for reasons other than intra-institutional policy decisions may be suspect, given the context-relative nature of "quality".

To assess quality, emphasis must be given to the relationship between the purpose(s) of an activity or program and the manifestations or during- and after-the-fact evidence that the college experience was meaningful and resulted in "value added" changes on the part of students and society. Persons' values differ as do the meanings they attach to the same experience. Multiple perspectives on the quality of undergraduate experience must be acknowledged and can be adequately estimated only through the use of different but complimentary data gathering approaches.

REFERENCES

Adams, A. V., & Krislov, J. Evaluating the quality of American universities: A new approach. Research in Higher Education, 1978, 8, 97-109.

Astin, A. W. Undergraduate achievement and institutional excellence. Science, 1968, 161, 661-668. (a)

Astin, A. W. Who goes where to college. In K. Yamamoto (Ed.), The college student and his culture. Boston: Houghton-Mifflin, 1968b.

Astin, A. W. Preventing students from dropping out. San Francisco: Jossey-Bass, 1975.

Astin, A. W. Four critical years. San Francisco: Jossey-Bass, 1977.

Astin, A. W. Student-oriented management: A proposal for change. In Evaluating Educational Quality: A Conference Summary. Washington, D.C.: Council on Postsecondary Accreditation, 1979. (ED 165 648)

Astin, A. W. When does a college deserve to called "High Quality"? In Improving Teaching and Institutional Quality, 1980 Current Issues in Higher Education, No. 1. Washington, D.C.: American Association for Higher Education, 1980.

Astin, A. W., & Panos, R. J. The educational and vocational development of college students. Washington, D.C.: American Council on Education, 1969.

Astin, A. W., & Panos, R. J. The evaluation of educational programs. In R. L. Thorndike (Ed.), Educational measurement. Washington, D.C.: American Council on Education, 1971.

Astin, A. W., & Scherrei, R. A. Maximizing leadership effectiveness: Impact of administrative style on faculty and students. San Francisco: Jossey-Bass, 1980.

Astin, A. W., & Solmon, L. C. Measuring academic quality: An interim report. Change, 1979, 11, 48-51.

Bean, J. P. The synthesis of a theoretical model of student attrition. Paper presented at the 1981 Meeting of the American Educational Research Association, Los Angeles, April 1981.

Benezet, L. T. A question of accreditation:Time for a general review. Change, 1981, 13, 6-8.

Berdie, R. F. The study of university students. Journal of College Student Personnel, 1972, 13, 4-11.

Blau, P. M., & Margulies, R. Z. The reputations of American professional schools. Change, 1974, 6, 42-47.

Bowen, H. R. Investment in learning: The individual and social value of American Higher Education. San Francisco: Jossey-Bass, 1977.

Bowen, H. R. Goals, outcomes, and academic evaluation. In Evaluating educational quality: A conference summary. Washington, D.C.: Council on Postsecondary Accreditation, 1979. (ED 165 648)

Bowen, H. R. Cost differences: The amazing disparity among institutions of higher education in educational costs per student. Change, 1981, 13, 21-27.

Bragg, A. K. The socialization process in higher education, ERIC/Higher Education Research Report No. 7. Washington, D.C.: American Association for Higher Education, 1976.

Brown, K. I. Sitting one's way through college. Journal of Higher Education, 1937, 8, 457-463.

Boulding, K. E. Quality versus equality: The dilemma of the university. Daedalus, 1975, 104, 298-303.

Campbell, A., Converse, P. E., & Rogers, W. L. The quality of American life. New York: Russell Sage, 1976.

Cartter, A. M. An assessment of quality in graduate education. Washington, D.C.: American Council on Education, 1966.

Centra, J. A., & Rock, D. College environments and student academic achievement. Research Bulletin. Princeton, N.J.: Educational Testing Service, 1970.

Chickering, A. W. Education and identity. San Francisco: Jossey-Bass, 1969.

Chickering, A. W. The best colleges have the least effect. Saturday Evening Review, 1971, 54, 48-54.

Chickering, A. W. Commuting versus resident students. San Francisco: Jossey-Bass, 1974.

Chickering, A. W., McDowell, J., & Campagna, D. Institutional differences and student development. Journal of Educational Psychology, 1969, 60, 315-326.

Clark, B. R., Heist, P., McConnell, T. R., Trow, M. A., & Yonge, G. Students and colleges: Interaction and change. Berkeley: Center for Research and Development in Higher Education, University of California, Berkeley, 1972. (ED 069 255)

Cohen, M. D., & March, J. G. Leadership and ambiguity: The American College President. New York: McGraw-Hill, 1974.

Cottle, T. J. The effects of college on individuals: Three life studies. In L. C. Solomon & P. J. Taubman (Eds.), Does college matter. New York: Academic Press, 1973.

DeCoster, D. A., & Mable, P. Personal education: Community development in college residence halls. Washington, D.C.: American College Personnel Association, 1980.

Epstein, J., & McPartland, J. The concept of measurement of the quality of school life. American Educational Research Journal, 1976, 13, 15-30.

Feldman, K. A., & Newcomb, T. M. The impact of college on students (Vol. 1). San Francisco: Jossey-Bass, 1973.

Freedman, M. B. Studies of college alumni. In N. Sanford (Ed.), The American College. New York: Wiley, 1962.

Gaff, J. G., & Gaff, S. S. Student-faculty relationships. In A. W. Chickering & Associates (Eds.), The Modern American College. San Francisco: Jossey-Bass, 1981.

Gourman, J. The Gourman report: A rating of undergraduate programs in American and international universities. Los Angeles: National Education Standards, 1977.

Guba, E. G. Toward a methodology of naturalistic inquiry in educational evaluation. Los Angeles: University of California- Los Angeles: Center for the Study of Evaluation, 1978.

Harshman, C. F. A model for assessing the quality of non-traditional programs in higher education. St. Louis: St. Louis University, Metropolitan College, 1979. (ED 175 321)

Heath, D. H. Growing up in college. San Francisco: Jossey-Bass, 1968.

Hutson, H. Inservice best practices: The learnings of general education. Bloomington, IN: National Inservice Network, 1979.

Jenny, H. H. Institutional financial assessment: Methodology and meaning. Research in Higher Education, 1979, 10, 59-70.

Karabel, J., & Astin, A. W. Social class, academic ability, and college quality. Washington, D.C.: American Council on Education, 1972.

Kegan, D. L. The quality of student life and financial costs: The cost of social isolation. Journal of College Student Personnel, 1978, 19, 55-58.

Keeton, M. T. Models and mavericks. New York: McGraw-Hill, 1971.

Keeton, M. T. An approach to a theory of quality control. In Remarks To A Conference on Quality Control in Nontraditional Higher Education. Columbia, MD: Antioch College, 1974. (ED 098 868)

Knefelkamp, L. L. Faculty and student development in the 80's: Renewing the community of scholars. In Improving Teaching and Institutional Quality, 1980 Current Issues in Higher Education, No. 5. Washington, D.C.: American Association for Higher Education, 1980.

Kolb, D. A. Learning styles and disciplinary differences. In A. W. Chickering (Ed.), The modern American College. San Francisco: Jossey-Bass, 1981.

Kuh, G. D. Indices of quality in the undergraduate experience. ERIC-AAHE, 1981 Research Report, No. 4. Washington, D.C.: AAHE, in press.

Lincoln, Y., & Guba, E. G. The distinction between merit and worth in evaluation. Paper presented at the 1979 Meeting of the Evaluation Network, Cincinnati, Ohio, September, 1979.

McCall, S. Human needs and the quality of life. In J. King-Farlow & W. Shea (Eds.), Values and the quality of life. New York: Science History, 1976.

McCarthy, M. M. Adequacy in educational programs: A legal perspective. In K. F. Jordan & N. Cambron (Eds.), Perspectives in school support systems. New York: Ballinger, 1981.

McKeachie, W. J. Teaching tips: A guidebook for the beginning college teacher (7th ed.). Lexington, MA: Heath, 1978.

Meeth, L. R. Quality education for less money. San Francisco: Jossey-Bass, 1974.

Menges, R. J. Instructional methods. In A. W. Chickering (Ed.), The Modern American College. San Francisco: Jossey-Bass, 1981.

Merriam, G. & C. Co. Webster's new collegiate dictionary. Springfield, MA: 1976.

Messick, S. & Associates. Individuality in learning: Implications of cognitive styles and creativity for human development. San Francisco: Jossey-Bass, 1976.

Millett, J. D. The states face issues of quality in higher education. Paper presented to Invitational Seminar for Members of Statewide Coordinating and Governing Boards, Columbus, Ohio, July 1979. (ED 177 960)

Moos, H. Evaluating educational environments. San Francisco: Jossey-Bass, 1979.

Olscamp, P.J. Can program quality be quantified? Journal of Higher Education, 1978, 49, 504-511.

Pace, C.R. College and University Environment Scales: Technical manual (2nd ed.). Princeton, NJ: Education Testing Service, 1969.

Pace, C.R. Measuring outcomes of college: Fifty years of findings and recommendations for the future. San Francisco: Jossey-Bass, 1979.

Pace, C.R. Measuring the quality of student effort. In Improving Teaching and Institutional Quality, 1980 Current Issues in Higher Education, No. 1. Washington, D.C.: American Association for Higher Education, 1980.

Pace, C.R. Measuring the quality of undergraduate education. Paper presented at the Meeting of the American Educational Reaearch Association, Los Angeles, April, 1981.

Palola, E.G. Quality indicators: An approach to measuring program success. Paper presented at the Meeting of The American Educational Research Association, San Francisco, April, 1976. (ED 125 451)

Parlet, M., & Hamilton, D. Evaluation as illumination: A new approach to the study of innovative programs. In G.V. Glass (Ed.), Evaluation Studies Review Annual No. 1, Beverly Hills, CA: Sage, 1976.

Pascarella, R.T. Student-faculty informal contact and college outcomes. Review of Educational Research, 1980, 50, 545-595.

Pascarella, E.T., & Terenzini, Patrick. "Patterns of student-faculty informal interaction beyond the classroom and voluntary freshman attrition." Journal of Higher Education, 1977, 48, 540-552.

Perry, W.G., Jr. Cognitive and ethical growth: The making of meaning. In W. Chickering (Ed.), The modern American College. San Francisco: Jossey-Bass, 1981.

Perry, W.G., Jr. Forms of intellectual and ethical development in the college years. New York: Holt, 1970.

Pirsig, R.M. Zen and the art of motorcycle maintenance. New York: Morrow, 1974.

Rock, D.A.; Centra, J.A., & Linn, R.L. Relationships between college characteristics and student achievement. American Educational Research Association Journal, 1970, 7, 109-121.

Rossman, J. An experimental study of faculty advising. Personnel and Guidance Journal, 1967, 46, 160-164.

Sanford, R.N. The American College. New York: Wiley, 1962.

Sanford, N.R. Where colleges fail: A study of the student as a person. San Francisco: Jossey-Bass, 1967.

Roose, K.D., & Anderson, C.J. A rating of graduate programs. Washington, D.C.: ACE, 1970.

Scott, R.A. Program reviews missing members: A consideration of quality and its assessment. College Board Review, 1980 (Winter), 18-21, 30.

Siebel, C. C. Courses and a 'plus'--an innovative program for undergraduates: Fourth year evaluation. Paper presented at the Meeting of the National Association of Women Deans and Counselors, April 1973, in Cleveland, Ohio.

Sharp, L.M. Education and employment. Baltimore: Johns Hopkins University Press, 1970.

Sherman, C.E. Rationale for use of ethnography in the study of educational problems. CEDR Quarterly, 1981, 14, 10-11.

Snyder, B.R. The hidden curriculum. New York: Knopf, 1971.

Solmon, L.C. The definition and impact of college quality. New York: National Bureau of Economic Research, 1972. (ED 065 080)

Solmon, L.C. A multidimensional approach to quality. In T.M. Stauffer (Ed.) Quality: Higher education's principal challenge. Washington, D.C.: American Council on Education, 1981.

Spady, W. Dropouts from higher education: Toward an empirical model. Interchange, 1971, 2, 38-62.

Spaeth, J.L., & Greeley, A. Recent alumni and higher education. Carnegie Commission on Higher Education. New York: McGraw-Hill, 1970.

Stark, J.S., & Lowther, M. Measuring higher education quality. Research in Higher Education, 1980, 13, 283-287.

Stauffer, T.M. (Ed.) Quality--Higher education's principal challenge. Washington, D.C.: ACE, 1981.

Stern, G.G. People in context. New York: Wiley, 1970.

Straumanis, E. Qualitative evaluation and the assessment of program quality. Paper presented at the Association for Institutional Research Annual Forum, Minneapolis, May 1981.

Stufflebeam, D.L.; Foley, W.J.; Gephart, W.J.; Guba, E.G.; Hammond, R.L.; Merriman, H.O. and Provus, M.M. Educational evaluation and decision-making. Itasca, IL: Peacock: 1971.

The Student Task Force on Education at Stanford. The other Stanford. Palo Alto, CA: Stanford Workshop on Political and Social Issues, 1973.

Thistlewaite, D.L. College environments and the development of talent. Science, 1959, 130, 71-76.

Troutt, W.E. Regional accreditation evaluative criteria and quality assurance. Journal of Higher Education, 1979, 50, 199-210.

Trow, M. The public and private lives of higher education. Daedalus, 1975, 101, 113-127.

Upton, M. Quality in higher education. North Central Association Quarterly, 1963, 37, 307-314.

Wachtel, P. The effect of school quality on achievement, attainment levels, and lifetime earnings. Explorations in Economic Research, 1975, 2, 502-536.

White, W. Lives in progress (2nd ed.). New York: Holt, Rinehart & Winston, 1966.

Williams, D.S.; Reilley, R.R., & Zgliczynski, S.M. Changing students and changing residence halls: Research and implications. In D. DeCoster and P. Mable (Eds.), Personal education: Community development in college residence halls. Washington, D.C.: American College Personnel Association, 1980.

Willingham, W.W. The case for personal qualities in admissions. College Board Review, 1980, 116, A2-A8.

Wilson, E.K. The entering student: Attributes and agents of change. In T.M. Newcomb (Ed.), College peer groups. Chicago: Aldine, 1966.

Wise, Arthur. Minimum educational adequacy: Beyond school finance reform. Journal of Education Finance, 1976, 1, 468-483.

Witney, S.B. Quality of life as an educational outcome. In Educational indicators: Monitoring the state of education. Princeton, NJ: Educational Testing Service, 1975. (Ed 150 147)

Wolf, R.L. Strategies for conducting naturalistic evaluation in socio-educational settings. Kalamazoo, MI: Occasional Paper Series, Western Michigan University Evaluation Center, 1979.

Young, K.E. Evaluating institutional effectiveness. Educational Record, 1976, 57, 45-52.

Table 1

Relationships Between Quality and Selected Context Variables

Independent Variable	Dependent Variable	Direction and Strength of Relationship
Institution size		
Rock Centra & Linn (1970)	Achievement	- moderate to low
Astin (1968a)	Achievement	0
Astin (1977)	Campus leadership	- moderate
Astin (1968b)	Perceived prestige	- moderate
Chickering (1969); Heath (1968)	Personal development opportunities	-
Bowen (1977)	"Educational advantage"	-
Meeth (1974)	Cost per student	0
Department size		
Millett (1979)	Department "quality"	+
Meeth (1974)	Faculty/student interaction	+
Institutional purpose		
Astin (1980); Chickering (1969); Heath (1968); Keeton (1971); Meeth (1974)	Developmentally powerful community	- moderate to high
Organizational properties		
Troutt (1979)	Accreditation	0
Bean (1981); Benezet (1981); Berdie(1972)	Students involvement in and understanding of institutional operations	+
Bowen (1979)	"Quality"	0
Bragg (1976); Gaff & Gaff (1981); Stanford Student Task Force (1973)	Student/faculty interaction	+
Grading practices		
Wilson (1969)	Achievement (GPA)	-
Financial resources		
Troutt (1979)	Accreditation	+
Astin (1968a)	GRE scores	0
Rock, Centra & Linn (1970)	GRE scores	+ low
Adams & Krislov (1978)	Gourman (1977) Index	+ moderate
Solmon (1972, 1975)	Post college income	+ low
Bowen (1981); Meeth (1974)	"Quality"	0
Student living environments		
Wilson (1966)	Knowledge acquisition	+
Astin (1977); Chickering (1974); Feldman & Newcomb (1969)	Personal development	0,+ low
Williams, Riley & Zgliczynski (1980)	Grades, persistence and involvement	+

Table 2

Relationships Between Quality and Selected Input Variables

Independent Variable	Dependent Variable	Direction and Strength of Relationship
Ability		
Astin (1968); Astin & Panos (1972)	Perceived institutional affluence	+ moderate
Non-intellective/biographical characteristics		
Willingham (1980)	Liberating experience	+ low
Moos (1979); Stern (1970)	Satisfaction with institution	+ low
Astin (1968)	Student-environment fit	+ low

Table 3

Relationships between Quality and Selected Involvement Variables

Independent Variable	Dependent Variable	Direction and Strength of Relationship
Peer interaction		
Astin & Scherrei (1980); Feldman & Newcomb (1969)	"Quality"	+ low-moderate
Astin (1977)	Persistence, personal development, satisfaction	+ low-moderate
Kegan (1978)	Satisfaction	+
Chickering (1974); Bragg (1976)	Personal development	+ moderate
Newcomb (1962); Stern(1962)	Attrition, dissatisfaction	+
Instruction		
Menges (1981); McKeachie (1978)	Learning outcomes	+
Kolb (1981); Messick et al. (1976)	Development of intellect	+
Informal student-faculty interaction		
Pascarella (1980)	Student development; satisfaction	+
Stanford Task Force (1973); Sanford (1967); Trow (1975)	"Quality"	+
Centra & Rock (1970)	GRE scores	+ moderate
Bean (1981)	Persistence	+
Thistlewaite (1959)	Graduate study	+
Bragg (1976); Feldman & Newcomb (1969)	Socialization	+
Student effort		
Brown (1937)	Maximizing institutional resources	+
Astin (1980)	Achievement	+
Pace (1979, 1980, 1981)	Achievement, personal development	+

Table 4

Relationships Between Quality and Selected Outcome Variables

Independent Variable	Dependent Variable	Direction and Strength of Relationship
Persistence		
Astin (1979); Kegan (1974)	General satisfaction	+ moderate
Pascarella (1980); Pascarella & Terenzini (1977); Rossmann (1967); Spady (1971)	Faculty-student interaction	+
Astin (1975); Blake (1971); Seibel (1973)	Peer involvement	+
Astin (1975)	Self esteem	+ moderate
Astin (1975, 1977)	Grade point average	+ low-moderate
Achievement		
Astin & Panos (1969)	"Value added" achievement	0
Pascarella (1980)	Faculty-student interaction	+ moderate
Sharp (1970)	Graduate school, occupation	0
Personal development		
Chickering, McDowell & Campagna (1969); Clark et al. (1972); Trent & Medsker (1969)	Institutional type	0
Post-college salary		
Solmon (1975)	Gourman index	+
Bowen (1977)	"Quality" college	+
Alumni activities		
Spaeth & Greely (1970)	Institutional "quality"	0

Table 5

Advantages and Disadvantages of Quantitative and Qualitative Approaches to Quality Assessment

Quantitative	Qualitative
Advantages:	Advantages:
Reliance on psychometric inquiry paradigm (objective measures)	Acknowledges multiple realities and purposes
Preordinate design results in greater efficiency	Seeks context and participant relevant data
Data amenable to traditional computer driven analytic procedures	Provides rich, "thick" descriptions of students' experiences
Data amenable to intra- and interinstitutional comparisons across time (generalizability)	Serendipity is documented
	Responsive to emergent issues and pluralistic values/perspectives related to quality of student experiences
Disadvantages:	Disadvantages:
Underemphasize involvement manifestations of quality	Labor intensive
Relatively insensitive to unintended effects or outcomes (serendipity)	Data not easily collated or compared within or across institutions
Unidimensional (single reality) inquiry is emphasized	Input and, to a lesser extent, context indicators are deemphasized
Diversity in students' experiences is masked	Results seem "subjective", not "hard" evidence